the image pattern in its received header section 6a, and decodes the received data section 6b using the parameters in the received header section 6a so as to form recovered binary data 8.

In discussing the present invention in further detail, it is useful to consider, with reference to FIG. 2, a computer system 100 embodying the present invention. The computer system 100 includes a server apparatus 110 which is communicatively coupled via server-to-host channel 112 to a host apparatus 120 (which may also be referred to as client apparatus 120). Host apparatus 120 is further communicatively coupled via host-to-peripheral channel 122 to a peripheral apparatus 130. A preferred embodiment of peripheral apparatus 130 is a printer; in such an embodiment, host-to-peripheral channel 122 is a print channel over which text and images to be printed can be sent to the printer. A preferred embodiment of server 110 provides requested web pages to the host 120. As will be discussed subsequently, certain web pages may be linked to the binary data 2 or to the encoded linear matrix image 4. A preferred embodiment of host 120 includes a transforming image data channel. As will also be discussed subsequently, this data channel typically has a web browser which renders the text and images of the web page, including the encoded linear matrix image 4, and a print driver which forms a printer control language (PCL) representation of the web page text and images, including the transformed linear matrix image 6. A preferred embodiment of peripheral 130 includes the linear matrix decoder subsystem 60 which detects the transformed linear matrix image 6,

compensates for the transformations done by the image data channel 40, and recovers the recovered binary data 8.

One preferred embodiment of the binary data 2 is an upgrade to the computer-readable instructions stored in a memory device 132 that are executed by a processor (not shown) in peripheral 130 in order to perform the functions of peripheral 130. Another embodiment of the binary data 2 is an advertisement or a discount coupon that are to be stored for periodic or future use in the memory 132. For example, in the case of a printer, the binary data may represent information for a coupon that offers a percentage discount when presented for an ink purchase, and an instruction to the printer to print out a copy of that coupon after every 200 pages are printed.

In the preferred embodiment of computer system 100, memory 132, along with memory 114 of server 110 and memory 124 of host 120, contain computer-executable instructions that are performed by one or more processors (not shown) in order to implement modules of system 100 and steps of the method of the present invention.

Considering now in further detail a preferred embodiment of the server 110, and with reference to FIG. 3, a server 110a may optionally include a data encryptor 22 which encrypts the binary data. Encrypting the binary data can protect data such as proprietary firmware algorithms for the printer, or valuable coupons. Encrypting may also be used to prevent unauthorized use of the binary data transmission methods, such as the transmission of unauthorized coupons or advertisements in place of the authorized ones. In other embodiments, encryption may provide data redundancy so that error detection

and correction (EDC) can be done by the printer to ensure that the recovered binary data 8 is identical to the original binary data 2. The encrypted data 24, including the encryption key, are provided to a linear matrix encoder module 26 of the linear matrix encoded subsystem 20; however, if encryption is not performed, then the binary data 2 is provided to the linear matrix encoder module 26 of the linear matrix encoded subsystem 20 instead.

A distortion compensator module 28 of the linear matrix encoder subsystem 20 provides a set of encoding parameters 30 to the linear matrix encoder module 26. The encoding parameters 30 are adapted for encoding the binary data 2 in such a manner that the transformed matrix image 6 is reconstructable into the encoded linear matrix image 4 by the linear matrix decoder subsystem 60. The encoding parameters 30 will be described subsequently in greater detail, as will the usage of these encoding parameters 30 by the decoder subsystem 60. In some embodiments, image-distortion characteristics 32 for the image data channel 40 may be provided to the distortion compensator 28 by the image data channel 40, and analyzed to determine encoding parameters 30 that are tuned to the particular channel 40. In other embodiments where the image-distortion characteristics 32 are not known to the distortion compensator 28, the distortion compensator 28 will generate worst-case encoding parameters 30 that will allow reconstruction of recovered binary data 8 from transformed matrix images 6 produced by a wide variety of image data channels 40.

The linear matrix encoder module 26 encodes the binary data 2 into the encoded linear matrix image 4 according to the encoding parameters 30. Preferably the encoded